

LOW-BORON GLASS FIBERS AND GLASS COMPOSITIONS FOR MAKING THE SAME

Abstract of the Invention

5 Low-boron, high-barium glass compositions and fine-diameter glass
fibers for forming clean room HEPA and ULPA filters, are provided. The
compositions and resulting glass fibers preferably comprise a low concentration,
less than about 1 weight percent, of boric oxide, a relatively high concentration
of barium, such as from about 5.5 to about 18 weight percent barium oxide,
10 and a concentration of alkali oxide ranging from about 10 to about 14.5 weight
percent. Alumina is preferably present in the glass fiber compositions and the
resulting glass fibers in a range of from about 4 weight percent to about 8
weight percent, and calcium oxide and magnesium oxide are preferably present
in a range of from about 1 weight percent to about 6 weight percent and from
15 about 0 weight percent to about 3.5 weight percent, respectively. The glass
fiber compositions also preferably include from about 2 to about 6 weight
percent zinc oxide, from about 0.1 to about 1.5 weight percent fluorine, and
very low concentrations of manganese oxide, ferric oxide and various impurities
such as strontium oxide, lithium oxide, titanium oxide, and zirconium oxide.
20 Preferably, the balance of the composition is silicon dioxide.